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Building apprentices' skills in the workplace: Car Service in Germany, the UK and Spain

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Abstract

This paper analyses how employers in three countries, Germany, the UK and Spain experience and view apprenticeship. The focus is a single occupation – Vehicle Maintenance and Repair (Car Service) based on case studies and a representative employer survey carried out in the three countries. Apprenticeship is well-established in Germany and is strongly promoted by the UK government. In Spain, Car Service courses are full-time college courses which include a workplace internship. German and UK firms are satisfied with the practical and theoretical content of apprenticeship programmes but case study evidence reveals that the workplace training element of apprenticeship makes heavy demands on firms' resources. Spanish courses demand less of employers but skills are less well-developed. While German Car Service firms train more apprentices than they immediately require, UK firms under-invest in apprenticeship citing the heavy time demands on experienced employees. Local employer associations in Germany ensure that firms act cooperatively to procure an adequate skill supply. In the UK firms incur high recruitment costs as a result of skill shortages but refrain from apprenticeship through fear of poaching. Spanish firms value the internship period as a way of screening potential employees. Full-time college courses with a short internship are inadequate as a preparation for multi-skilled employment in an occupation with a strong technical knowledge base and electro-mechanical skills content. The UK should consider a different financing model for technical apprenticeships. In addition, increased labour market regulation and employer cooperation could encourage investment in apprenticeship.

JEL Classification: I24; I25; J24

Keywords: Tags: vocational education; apprenticeship; international comparisons

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Executive Summary

Using survey and case study evidence from Germany, the UK and Spain this paper examines the impact of apprenticeship (Germany and the UK) and full-time college training (Spain) on firms in the Motor Vehicle Maintenance and Repair sector (henceforth Car Service) that provide apprenticeship and work placements. In all three countries a high proportion of firms are SMEs (l -19 employees).

Car Service apprenticeship in Germany is of similar duration and standard to that specified for the UK Level 3 apprenticeship. Both German and UK apprentices acquire skills in the workplace and study underpinning technical knowledge for a day a week (or equivalent). In Spain, vocational training for Car Service consists of a full-time College Course and a mandatory period of work experience. Our survey evidence shows that German and UK apprenticeship training prepares employees to be multi-skilled in contrast to Spain where some employees do not progress beyond low-skilled jobs.

Small German Car Service firms are far more likely to train apprentices than small UK firms. UK firms train fewer apprentices than German firms but are much more likely to employ those they have trained.

Some important differences in the institutional context in which German firms engage with apprenticeship may help to explain this. The German case study firms not only invested time resources in apprenticeships but are also members of local trade associations which encourage cooperative behaviour to boost apprenticeship numbers. A fixed duration requirement for the apprenticeship, which allows the firm to benefit from the apprentice's productivity and offset costs, helps the German firms to invest with more confidence. There is no fixed duration for the English apprenticeship. A long tradition of work-place training in the German firms means that almost all employees are apprentice-trained and therefore familiar with the programme of skills to be acquired in the workplace. Consequently responsibility for training can be shared by all employees.

While German Car Service employers over-train, UK firms are not recruiting apprentices in numbers sufficient to overcome serious skill shortages created by lack of investment in apprenticeship, in the 1980s and 1990s. Although the alternative to apprentice training, recruiting skilled technicians on the open labour market, incurs costs of between eight and

ten thousand pounds, the smaller UK firms judged that the outcome of investment in apprenticeship was too uncertain.

Skill supply from Spain's full-time college-based vocational route is more reliable and supply is more easily managed but fails to adjust supply to demand. It is not well-adapted to industry's skill needs. The investment required from firms providing work placements is low and the work placement element can provide screening opportunities. However, periods of work experience linked to college courses as found in Spain fail to provide the intensive skill learning and consolidation provided by apprenticeship. A new initiative, Dual Vocational Training (DVT) incorporating a period of longer and more intensive work training into Car Service Courses suggests a way of improving the outcome for both firms and students.

A clear difference emerges from this study between the apprenticeship model of skill production and the full-time school-based route integrated into the wider education system. Spanish firms use work experience to screen trainees for possible employment and claim that short periods of work experience cannot deliver the skills they require. The planned renewal in England of full-time technical qualifications and courses for 16-18 year olds means that policy makers need to better understand the strengths and limitations of full-time technical training provision and its impact on skill supply and work organisation. The example of Spain illustrates employers' reactions to this form of provision.

Apprenticeship delivers Car Service skills more effectively than full-time college courses. However, apprenticeship training such as Car Service with a strong technical knowledge base and electro-mechanical skills content requires the apprentice to be supervised by a skilled technician while in the workplace. This requirement makes heavy demands on the resources of the smaller firms that dominate the sector. This is a particular problem for UK firms where technician skills are already in short supply. The investment of resources up-front has to be made while there is an uncertain outcome for the firm and the apprentice. If the supply of trained apprentices is insufficient and poaching is widespread, firms will be reluctant to invest.

In this study, both labour market regulation and employer coordination emerge as key elements providing German employers with the confidence to invest in apprenticeship. A fixed duration requirement for the apprenticeship, which allows the firm to benefit from the apprentice's productivity and offset costs, helps German firms to invest with more

confidence. There is no fixed duration for the English apprenticeship and a longer apprenticeship duration could likewise help reduce the costs to firms.

However, a fixed duration for the award of an apprenticeship will only reduce uncertainty if, as in Germany, labour market regulation and cooperation between firms in a locality or region helps to enforce a hiring preference for a completed apprenticeship. Otherwise, apprentices may leave for another employer before completion. Labour market regulation in England, for example, requiring a completed apprenticeship for MOT certification status, combined with greater cooperative behaviour between firms could allow firms to invest in apprenticeship with more confidence. But ultimately, the UK government will need to start recognising the heavy demands that technical apprenticeships make on firms, in particular small firms. Apprenticeships which require a heavy investment in workplace training should be treated differently from those service sector apprenticeships where only light supervision is required in the workplace. Without such a change of direction many sectors reliant on skilled technicians will fail to flourish.

1. Scope and aims of the study

Policy makers recognise that, in times of economic crisis, countries with a wide use of work-based (dual system) apprenticeships have lower levels of youth unemployment (OECD, 2010). Full-time school-based vocational training systems characterize many European countries and in recent years initiatives have been taken to establish and strengthen dual system vocational and education and training (VET) structures in those countries (OECD & ILO, 2017). The aim of the paper is to provide a research-based contribution to the international policy debate on expanding dual work-based vocational education.

Dual-system apprenticeship depends on the willingness of employers to offer training places and on their ability to provide high quality training in the workplace. An important condition for developing dual-system apprenticeship training and supporting increased participation of firms in building skilled worker supply is to understand firms' motivation for engagement or disengagement, how they recruit and deliver training, and their skill needs.

In this paper, we look at these questions for the automotive service sector which shows some unique features that make it particularly interesting for such comparisons. Accordingly, this paper is not comparing vocational training systems – as many others did before - but compares firms' behaviour as regards engaging in recruitment and skills development in different national labour markets and training systems.

The Motor Vehicle Maintenance and Repair sector (ISIC 452 henceforth Car Service) forms part of the larger motor vehicle sales and service sector and is essentially a non-traded sector with little reliance on skills from outside the country of location. It is therefore highly dependent on indigenous skill production. In addition, the services that have to be provided by firms are equivalent across countries (e.g. as opposed to many other services provided in the crafts sector that might be highly differentiated in scope and quality across countries). In principle firms should have very similar skill needs, however, the different labour markets and vocational education and training systems will have an influence on their recruitment and training practices.

In Germany the supply of skills in the sector is largely based on a well-established dual apprenticeship and forms part of the secondary/post-secondary educational system. Spain

represents a full time school-based vocational education and training system in which firms' involvement takes the form of internships, induction phases or contracts of employment which are specifically designed for job entrants (European Commission et al., 2012; European Commission & IKEI, 2012). England is an example of a recently renewed apprenticeship system in which government rather than employers takes the lead in determining apprenticeship policy and where employer engagement has been slow to develop and expand (House of Lords, 2007; OECD, 2009). [1]

Whilst the basic interest of this contribution is to learn about the mechanisms that support the engagement of firms in education and training, this study also aims to inform the national policy debate in England and Spain by comparing their employer engagement in VET with employer engagement in Germany. England needs to understand and learn from Germany how to encourage more small firms to offer apprenticeships (Pullen & Clifton, 2016). The planned renewal in England of full-time technical qualifications and courses for 16-18 year olds means that policy makers also need to better understand the strengths and limitations of full-time technical training provision and its impact on skill supply and work organisation. The example of Spain shows how employers react to this form of provision.

Spain has responded to the call to transfer the concepts of apprenticeships and work-based learning to countries with significant youth unemployment problems (Ministers of Labour and Employment from G20 members, 2016) and is experimenting with modifications to the full-time provision model that target the expansion of firm based learning in VET (Milolaza, 2012). This paper provides evidence of Spanish employers' experience of these new models of vocational training.

The remainder of this paper is structured as follows: Section 2 analyses the survey and case study material, and focuses on three main topics: Car Service work organisation; the supply of skills and recruitment of skilled Car Service technicians; investment in apprenticeships. Section 3 concludes.

[1] The devolved administrations in the UK (Northern Ireland, Wales and Scotland) have responsibility for much of the decision-making on apprenticeship provision in the UK. Therefore the terms 'England' and 'UK' are used as appropriate. The INDUCT survey referred to the UK and the Case Studies were carried out in England.

2. Analysis of case studies and survey evidence

Our methodology is based on the analysis of case studies in Germany, Spain and the UK. We also use a survey of Car Service establishments in the three countries carried out by the BIBB as part of the project "Patterns of recruitment and induction in Car Service and health care in international comparison".[2]

All the interviews with Car Service companies were carried out in 2016; two in Germany and six in both the UK and in Spain. Interviewers used the same questionnaire template in all three countries. In Germany, both case study companies were small (26 and 10 staff respectively) in the UK and Spain, the six companies interviewed in each country covered a range of small and medium-sized firms. Full details are provided in the Appendix.

The survey of the Car Service sector (henceforth INDUCT) used stratified sampling of all businesses having at least one employee and designed to produce a sample of at least 250 establishments representing different size classes of car service businesses. The survey was carried out in Germany, Spain, UK and Korea between October 2010 and May 2014. The questionnaire dealt with the following topics: recruitment and induction practices, use of internships and apprenticeships, work organisation and general company features.

2.1 Work organisation

Cross-national differences in recruitment and training practices of firms need to be interpreted in conjunction with differences in work organisation (Green, 2013). A hierarchy of educational qualifications has been shown to determine vertical job differentiation in firms (Drexel, 1995). The way work is organised in firms can be seen both as the outcome of how a vocational education system shapes skilled labour supply and as an important context for work-based learning.

In the 1990s, the motor vehicle service sectors of various EU Member States were researched in a comparative manner in the context of several European projects (Rauner, Spöttl, Olesen, & Clematide, 1995). An important result was the discovery of significant

[2] Federal Institute for Vocational Training (BIBB) (Grollmann, Geiben, & Winterhager, 2015 referred to as INDUCT II) More information at https://www.bibb.de/en/55714.php
Grollmann, Geiben, Höcke, and Wolfgarten (2016)

differences in the work organisation of motor vehicle workshops and the occupational structures observed there. In southern European countries such as Spain or Greece there was a stronger specialisation and differentiation as opposed to Germany or the UK (INEM & CIREM, 1994; Papaionnou & Patsatzis, 1994; Rhys, 1994; Spöttl, 1995, 1997).

Our case study material confirmed that these differences persist. Similar patterns of work organisation were found in the German and English Car Service firms while Spain showed less multi-skilling. In both Germany and England, Car Service technicians were expected to carry out the whole range of routine and specialised service tasks; in England this included MOT testing for which additional certification was required. In the two German companies, individual employees were recognised as having particular strengths or specialisms but all were considered capable of undertaking the whole variety of service and repair work. The interviewee considered that an advantage of this arrangement is that if there is illness another employee can take over. *'We are all-rounders, we do everything, anyone who can't isn't a proper professional'*[3]

In the larger Spanish firms visited, a formal hierarchy of skills was institutionalised in job titles and consequent specialisation. There was also a greater tendency for Car Service firms in Spain to develop a degree of specialisation. Where specialisation was observed, service advisers acted as an interface between customers and technicians; technicians specialised in warranty and repair work, parts, bodywork, or paint shop.

These differences were reflected in different pay scales for technicians. Occupational hierarchies were formalised in two of the companies with service and repair staff graded as having first, second or third grade status. First grade technicians dealt with diagnostics and complex repairs and would be expected to have gained the higher level vocational qualification. Third grade mechanics, usually without a vocational qualification, carried out simple routine operations only. Trainees on work experience were restricted to simple routine work. Induction for new employees was a lengthy process and not all progressed to technician level.

These case study findings reflect and validate those reported from the INDUCT survey where Spanish firms were far more likely to have only one job position responsible for carrying out IT-aided error diagnosis compared to Germany and England, where over half

[3] *'Wir sind Allrounder, wir machen alles. Alle anderen sind Fachidioten'*

of firms reported that this task belongs to all or most job positions (Grollmann et al., 2015, p. 37, Table 17). There are also significant differences with regard to other domains of occupational activity, for example, client communication and economic decisions were more likely to be seen as a cross-functional task in England, which was in contrast to Germany and Spain.

Specialisation in Spanish firms means that providing dual-system apprenticeship training could not be fully introduced without a change in work organisation so that an apprentice could be trained on the full range of Car Service tasks. In England, work organisation is shown to be compatible with providing an apprentice with experience of the full range of skills to be acquired in the work-place.

2.2 Skill supply and recruitment of skilled Car Service technicians

The supply of skilled Car Service technicians in Germany and England is provided on employers' premises by work-based apprenticeship programmes. In Spain, full-time school-based courses (henceforth FTC courses/students) plus a minimum of 400 hours of work experience are required to gain a Car Service qualification. Dual Vocational Training courses based in colleges but incorporating longer periods (1000 hours) of work experience (henceforth DVT courses/students) are now being introduced. These form part of a government policy to improve young people's employment prospects (see above Section 1).

All German apprenticeships have a fixed duration lasting a minimum of 3 years and lead to a qualification classified to UK Level 3 (European Qualification Framework (EQF) Level 4). In the UK all apprenticeships must have a minimum duration of one year but there is no fixed duration requirement. Car Service apprenticeships lasting an average of 21 months lead to a qualification at UK Level 2 (EQF Level 3) and an apprenticeship qualification at UK Level 3(EQF Level 4) would normally last on average an additional 13 months. The Spanish full-time school qualification takes two years to UK Level 3 (EQF Level 4) and four years to UK Level 4/5 (EQF Level 5).

Table 1: Apprenticeship Starts (Germany, England) and Full-time College Course Starts (Spain) in Vehicle Service and Repair

	2006	2008	2013	2014	2015
Germany (a)	21,732	19,956	19,692	19,767	20,256
England (b)	8,840	8,900	8,500	9,010	9,500
Spain (c)	n/a	n/a	13,124	14,760	14,913

Notes: (a) Germany: Numbers starting apprenticeship *Kraftfahrzeugmechatroniker/-in Handwerk* and *Industrie* combined. Three year apprenticeship leading to EQF Level 4 (UK Level 3)
(b) England: Numbers starting Apprenticeship Framework Motor Vehicle Service and Repair at UK Level 2 (EQF Level 3) and UK Level 3 (EQF Level 4). The majority of those starting Level 3 have already gained Level 2.
(c) Spain: Estimated numbers starting courses in *Electromecánica de vehiculos automóviles Grado Medio* (EQF Level 3) and *Automoción Grado Superior* (EQF Level 5) Plan LOE. The majority of those starting *Grado Superior* have already gained *Grado Medio*. In this case duration is 2 years.
Sources: Germany: BIBB - DATENBLATT 25212370 *Kraftfahrzeugmechatroniker/-in;*
Spain:Ministerio de Educación, 2017; England: Department for Education & Education and Skills Funding Agency, 2017)

Table 1 shows for the three countries numbers starting an apprenticeship (Germany, England) or full-time college course with internship (Spain) in recent years. Relative to the size of the workforce, Germany trains substantially more apprentices than the UK. Numbers starting Car Service training in Spain are higher than the number of starts in the UK for a workforce only half the size of the UK workforce.

2.2.1 Firms' skill preferences

English case study firms expected their technicians to be trained to NVQ Level 3 which they would normally acquire through apprenticeship. The English firms experienced severe difficulties in ensuring a supply of technicians with skills at this level. The German case study firms required a completed apprenticeship as a minimum qualification and were less concerned about the supply of skills and high labour turnover. In Spain the case study firms required a Car Service vocational qualification at the lower level *(Grado Medio)* or at the higher level *(Grado Superior).*

The INDUCT survey clearly illustrates the differences between the three countries. In Germany, between 2008 and 2014, numbers of employees in SIC 452 Maintenance and Repair of Motor Vehicles increased by just under one fifth. In the UK they remained stable and Spain experienced a fall of almost one third. Yet despite this expansion in Germany and the larger numbers recruited, German firms in the survey recruited over 90 per cent of

new staff at their target level, a completed apprenticeship or above. In contrast, English firms recruited almost a third fewer new employees and of these just over half were at the firms' preferred level of UK Level 3 or above. Spain recruited half the number recruited in England but of these, over 90 per cent had the preferred qualification (Table 2).

Table 2 Qualifications of all new employees (not own apprentices) recruited in last five years by EQF Level

	Germany		UK		Spain	
EQF Level	**Number**	**%**	**Number**	**%**	**Number**	**%**
Level 3 (UK 2)	21	1.40	75	13.54	0	0.00
Level 4 (UK 3)	1184	78.78	165	29.78	195	70.91
Level 5 (UK 4)	77	5.12	122	22.02	55	20.00
Level 6 (UK 6)	147	9.78	10	1.81	0	0.00
No info	74	4.92	182	32.85	25	9.09
Allnewemploy	1503	100.00	554	100.00	275	100.00

Notes: Germany EQF Level 3= *Mitarbeiter mit Studienabschluss*; Level 4= *KFZ-Mechatroniker/KFZ /Elektriker; KFZ-Mechaniker u-ä;* EQF Level 5= *Techniker*; EQF Level 6=*Meister*. UK EQF Level 3 = MVMR Level 2 Intermediate Apprenticeship; EQF Level 4=MVMR NVQ Level 3 Advanced Apprenticeship; UKEQF Level 5=Senior Technician and Vehicle Maintenance Master; UKEQF Level 6= Staff with HEI degree qualifications. Spain EQF Level 4= Middle Level Degree in Electromechanics; EQFLevel 5= Upper Level Automotive Degree.
Source: INDUCT Survey; own calculations

2.2.2 Quality of trained Car Service technicians

Neither the German nor the English case study firms criticised the standards of training of the apprenticeship programmes in their respective countries. German firms had some criticisms of apprentices' attitudes and behaviour and the smaller English firms were not always happy with the training providers who administered the programme and supervised the trainees. Spanish firms were unhappy with the attitudes of trainees and the standards of training provided by the colleges.

Table 3 shows that UK firms were satisfied or very satisfied with apprentices' theoretical and knowledge skills - 82% of UK firms compared to 63% of German firms. Spanish firms were also happy with this aspect of skills training. However, less than a quarter of Spanish firms were satisfied with trainees' practical professional skills. Most UK firms were satisfied or very satisfied with apprentices' practical and professional skills (84%) compared to 63% of German firms.

Table 3 Satisfaction with the Car Service Apprenticeship Training System – professional skills and knowledge

	Satisfaction with training system	Country Germany		UK		Spain	
		N	%	n	%	n	%
Theoretical skills and knowledge	Very dissatisfied	8	3	3	2	4	2
	Dissatisfied	33	13	10	5	19	9
	Neither satisfied or dissatisfied	50	20	21	11	40	19
	Satisfied	146	59	129	67	135	66
	Very satisfied	10	4	29	15	8	4
	Total	247	99	192	100	206	100
Practical professional skills	Very dissatisfied	8	3	4	2	31	15
	Dissatisfied	31	13	9	5	75	36
	Neither satisfied or dissatisfied	53	22	19	10	53	26
	Satisfied	138	56	126	65	46	22
	Very satisfied	16	7	36	19	3	1
	Total	246	101	194	101	208	100

Source: INDUCT Survey as reported in Grollmann et al (2015) Table 12 p.30

2.2.3 Firms' recruitment strategies

Both German case study companies recruited most new employees through their own apprenticeship training. The smaller German case study company found the cost of recruitment on the external labour market to be extremely high. The larger company rarely

used advertising to recruit but used word of mouth and kept in contact with former employees.

The two larger UK case study companies reported a high churn of qualified technicians moving for higher salaries and frequently returning to the company after finding that the 'grass is not greener'. Recruitment agencies were used, as was poaching from other local businesses. This was often carried out by means of a firm's 'recommend a friend' scheme asking existing staff to refer people they know to the firm. One small company considered that: *'there isn't a good source of finding good technicians. The only way you can find them is someone else who's got one that you know of so yes, I think poaching is quite an issue'*

The case study interviews asked firms to provide a breakdown of the cost of recruiting an additional skilled technician. For England, estimated costs totalled £7,000-£8,000 to recruit and induct a new employee. One of the larger companies estimated the cost of recruitment and the period of induction training at £10,000. For Germany, estimated costs were somewhat lower at £5,000.

Four of the five larger Spanish firms interviewed reported experiencing a difficult business environment following the 2010 downturn in the economy which has only shown some improvement since 2014. As a consequence, they had either been forced to make staff redundant (one firm) or to pause recruitment. Recruitment procedures reflected the relatively good supply of potential employees and poaching was mentioned by only one company. None of the companies used recruitment agencies.

The INDUCT survey asked firms which if any of 14 recruitment channels they used when looking to contact new employees. Table 4 shows the three most frequently chosen channels for each country. For each country the INDUCT results reflect the responses provided by the case study companies. Nearly 90 per cent of German companies cited their own training activity as their most frequently used method of recruiting new employees followed by staff recommendations and word of mouth. For UK companies, informal channels – word of mouth and staff recommendations were the most frequently mentioned. In Spain, the recent fall in numbers employed in Car Service can help to explain why *unsolicited job applications* was the most frequently chosen method. This was also reflected in comments made in the Spanish case studies. However, in Spain a fifth of companies mentioned using training placements; this was subsequently found to be a favoured practice in the Spanish case study companies.

Table 4 Top three channels used by firms to find new recruits

Top 3	Germany	Top 3	UK	Top 3	Spain
Own training/Internship	86.97	Word of mouth	91.03	Unsolicited job applications	31.27
Staff recommendations	85.38	Staff recommendations	77.42	Public job centre	27.91
Word of mouth	81.99	Public job centre	58.28	Own training/Internship	20.46

Source: INDUCT Survey own calculations

Investment in apprenticeships

As partners in the training of apprentices, employers invest a variety of resources in the apprenticeship agreement. In this section we concentrate on the demands that apprentice training (work experience in the case of Spain) makes on the firm's resources.

In Germany, the employer has the responsibility of ensuring that the apprentice acquires the occupational skills specified by law for that occupation and also meets the cost of providing on-the-job training. A detailed schedule of the skills to be acquired and the order in which they should be learnt is published for each occupation. In practice there is scope for some modification of the order in negotiation with the local Chamber of Commerce. In addition, the employer agrees to release the apprentice for off-the-job training as specified for the occupation and for time to sit the required tests and examinations.

In England, a publicly-funded training provider is responsible to the government Funding Authority for ensuring that the apprentice acquires the occupational skills specified in the relevant Framework and for ensuring that the apprentice receives the off-the-job training specified. However, since the provider is normally responsible for apprentices in a number of different companies, the amount of training that can be provided varies widely from week-long residential courses to occasional visits. In reality, if the apprentice is to be successful, much of the task of occupational skills training and consolidation falls to the firm, to be fitted into the normal work schedule and, in the case of Car Service, delivered by an experienced technician. Depending on the provider, the employer may or may not be provided with guidance as to the ordering and scheduling of on-the-job training and must bear the costs in lost technician productivity.

In Spain, employers agree with a Vocational College to provide work experience for students, either 400 hours for the full-time college (FTC) students or 1000 hours for the (DVT) students. Students on the DVT course must be paid the minimum wage but FTC students on work experience are unpaid. Vocational Schools rather than the firms themselves determine the length of each period of work experience and have little control over the full-time students' timetable in the workplace. Employers are not expected to follow a schedule of training in the workplace but must provide an evaluation of the students' performance to the Vocational College which counts towards their final examination result.

In both of the German Car Service case study companies, the owners had started their careers in apprenticeship and the two companies regularly trained apprentices in order to procure a steady supply of skills. In the smaller of the two companies, all employees had been trained through apprenticeship with the company. In the larger of the two German companies, employees had also gained a *Meister* qualification.[4] As would be expected, the owners/directors of both businesses held a *Meister* qualification. The German firms were critical of the attitudes and work ethic of their apprentices and of the need to provide additional off-the-job training to meet the standards of the apprenticeship examinations at their own expense.

Only the best are taken on at the end of the apprenticeship. In both cases the owners actively contributed time and resources to support apprenticeship in their local area through membership of the local branch of the national trade association and as examiners in the practical tests which must be taken at the end of the apprenticeship. One of the two was also a committee member of the local Car Service employer Trade Association. The German case study companies provide examples of the way in which local Car Service trade associations encourage companies to train.

[4] The German *Meister* qualification usually entails at least two years of part-time study and further tests and examination. It is open to individuals who have completed an apprenticeship and gained some years of experience in the same occupational area. In certain craft occupations, of which Car Service is one, only *Meister* are entitled to set up and own a business in that occupation.

Box 1 The *Innung*, the local branch of the national Car Service Trade Association (TA) plays an important role in ensuring a supply of skills for the firms in its area. It is in charge of carrying out the practical examinations of apprentices because it was authorised by the responsible Chamber of Commerce according to Craft Sector Regulations (§ 33 Abs. 2 der Handwerksordnung) Based on this authorisation the Trade Association also collects the examinations fees. In some cases members can get reduced insurance fees as opposed to non-members. While membership of the local (craft) Chamber of Commerce is compulsory for companies, membership of the Trade Association is voluntary. TAs are employers' representatives in collective bargaining. Companies that are TA members are also committed to regional wage agreements negotiated between the TA and the Trade Unions. In addition the TA offers a range of important services and benefits which make membership desirable. Typically, TAs provide consultancy and support services in terms of taxes, legal issues, data and networking of companies and other benefit such as reduced insurance or energy costs etc. Most important is the quality assurance standard that membership of the TA provides and guarantees. This requires TA members to commit to quality benchmarks set by the TA which necessitate having well-trained employees.

As members of the local TA, the two case study firms have a strong incentive to train to continue to benefit from the TA badging (Deutsches Kraftfahrzeuggewerbe, 2017). In addition they may have experienced some "peer pressure" to be a member that is exerted by regional companies. According to a chamber representative from the region that was investigated, membership level is around 70%.[5]

None of the English case study companies spontaneously mentioned apprenticeship in the context of skill shortage. Of the six case study firms, only the two largest firms were training apprentices. Despite the fact that both owners of the two smallest firms had gained an apprenticeship at the start of their own careers, neither was employing an apprentice. One of the two had taken on a young person on work experience and was considering employing him on an apprenticeship. The other small firm was employing a former apprentice trained at the firm.

High levels of uncertainty concerning investment in apprenticeship were apparent when exploring the smaller companies' thinking about apprenticeship. The following aspects were a source of uncertainty:

- Demands that supervision and training of apprentices would make on their own skilled workforce. Because they were already reliant on overtime working to meet

[5] Personal phone interview and email correspondence, July 2017.

demand, any extra supervision or teaching of apprentices could overstretch their resources

- The possibility that apprentices would fail to complete the apprenticeship successfully *'if they're not going to make, not get to the standard that we want, then the money's lost'*
- The loss of their investment through poaching *'the highest skilled ones get poached all the time'*

Short-term horizons were also seen as a significant barrier to investment in apprenticeship: *'Too many businesses are running on a short-term profile…. managers only lasting a year… so nobody actually gets to see the benefit of somebody that started in an apprenticeship role'*

Trainees from Spanish FTC courses which require only 400 hours of work experience were less well-regarded by the companies. Some were perceived as not interested in their vocational specialism but only wanting to get a qualification which would lead to the next level of the education system. The 400 hour period of work experience was costly to the company in administration time and lost productivity: *'Each time an FTC learner starts we waste time*[6]*'*

The shorter period was considered inadequate to give the company the chance to assess the student's potential for future employment, especially as it was sometimes interrupted by periods of college study or if the trainee was in the workplace for only a few hours each day.

Four of the five larger Spanish companies had offered training places to DVT trainees.[7] DVT training which requires 1,000 hours in the workplace was perceived positively by three of the four companies which had experience of DVT trainees. The lengthier training period provided enough time for the trainee's suitability for employment to be assessed.[8] The fourth company had a number of criticisms of the college courses, principally that the standards of technical training were unsatisfactory. An impression was given that DVT

[6] "Cada vez que entra un alumno es una pérdida de tiempo".
[7] The Spanish case study companies were selected with the help of Vocational Training Colleges and therefore were likely to offer training placements.
[8] These issues are explored more extensively in the case study brief 'Description of case study ES_K2 – Dual apprentices as the (future) main recruitment strategy or how to avoid buying a pig in a poke' BIBB (forthcoming)

trainees were more able than FTC trainees. This may have resulted from selection or self-selection of more able candidates onto the DVT courses.

In addition to these issues, possible damage to vehicles by trainees and lack of time were mentioned as barriers to engagement in training. The companies with Dual Vocational Trainees anticipated hiring some or all of their DVT trainees in the near future in view of the improvement in the business climate. Although DVT trainees had to be paid the minimum wage, the companies expected that they would continue to prefer these over the unpaid FCT trainees who had a shorter period of practical experience. Their hope was that in future new employees would be sourced from the DVT trainees although in the case of one firm this was seen as a way of building a pool of potential recruits: *'It is an opportunity for us to have a pool [of potential employees] that is ready when we need them'*[9]

The INDUCT Survey put a number of questions to the participating firms in Germany and England about their involvement with apprenticeship training. In Spain, the same questions were asked but referred to the full-time school-based programmes (FTC) and the recent school-based Dual Vocational programmes (DVT).

Firms were asked whether they were currently employing/training one or more apprentices. Table 5 shows that, for each size group, German firms that responded to the question 'How many apprentices do you currently employ in the motor vehicle occupations just stated?' employed 2-4 times as many apprentices as the English firms.

Table 5 Mean number of apprentices currently employed

	Germany		UK		Spain	
Firm size	Mean	N	Mean	N	Mean	N
0-9	0.97	36	0.71	100	0.27	221
10-19	2.15	46	0.86	21	0.68	31
20-49	4.44	54	1.67	9	1.67	15
50-99	8.46	37	2.75	4	2.5	2
100-249	16.48	25	4	2	0	1

Note: Spain: Firms offering work experience to vocational school students on FTC courses.
Source: INDUCT Survey own calculations

[9] *'Es una oportunidad para hacer cantera y que esté preparado cuando les necesitemos'*

When the firms that had trained apprentices over the last five years were asked 'how many of these apprentices have been given an employment at your company following achieved qualifications over the past five years', English firms had a higher probability of taking on apprentices they had trained than the German firms (Table 6).

Table 6 shows that English firms are taking on apprentices with the purpose of retaining them as skilled workers. Because of the small size of enterprises within the Car Service sector it is sufficient to look at the group of enterprises that employs 1 to 19 employees:

Over forty per cent (44.1%) of small English firms employed 75% to 100% of their apprentices after termination of the programme. The figure in Germany of 6.5% is much lower in comparison. Only 29% of English firms answer that they had not employed apprentices after successful completion of their programme. The general tendency of German companies (see Box 2) to train more apprentices than needed is reflected in the 37.7% of German companies that answer that they have not retained any apprentice over the last five years.

The 53.6% in the Spanish case reflect the different function of training placements within VET in Spain. Training placements are used as a screening instrument than as a training instrument.

Table 6 Of apprentices previously employed and having achieved a qualification, numbers taken on by same firm as a percentage of all apprentices employed in previous five years

Firms 1-19 employees	Germany	UK	Spain
Taken on none	37.7	29.0	53.6
Taken on up to 25%	14.3	3.2	17.0
Taken onup to 50%	19.5	7.5	9.8
Taken on up to 75%	22.1	16.1	8.9
Taken on 75% to all	6.5	44.1	10.7

Only Valid N (companies that have employed trainees or apprentices and that have provided an answer to the question) and limited to the most significant size class for the sector.
Source: INDUCT Survey own calculations

The case study material shows the two German Car Service companies using apprenticeship – both their own apprentices and those trained by others –as their principal source of skilled Car Service technicians. All the English case study firms had recruited some staff on the open market using a variety of tools - recruitment agencies, networking and word of mouth were

most commonly cited. There was no spontaneous mention of apprenticeship in connection with recruitment in the English interviews.

While the English firms invested less in apprenticeship than the German firms and trained fewer apprentices, they did not spontaneously mention cost as a factor preventing them from employing apprentices.

While German firms and especially SMEs take on more apprentices than they will retain, the German case study firms claimed that there were no net benefits to the firm from training apprentices. However, the prevalence of over-training indicates that net cost is not a serious issue. One reason for this is probably the obligatory three-year apprenticeship duration which allows the firm to benefit from the apprentice's higher productivity in the later stages of the apprenticeship. Dropout has been shown to occur principally in the early stages of the apprenticeship before the firm has made a major investment in the apprentice

Spanish firms were not seriously concerned by skill shortages but were planning to expand their intake of DVT trainees to ensure a good future supply of qualified candidates for employment. These firms did not raise the issue of cost of offering work placements to the DVT trainees even though they were obliged by law to pay them the minimum wage.

Box 2 Over-training is a longstanding feature of Car Service apprenticeship in Germany. Firms over-train in order to screen and pool skilled workers and there is evidence that many firms incur no net costs of training. For apprentices the outcomes appear to be positive and the skills acquired highly transferable. A recent analysis of Car Service employee data showed that just over half (57%) of trained Car Service technicians are either working in Car Service or in a related sector. Just less than half (43%) of those with a Car Service qualification work in a completely different occupation. A high proportion (89%) of Car Service technicians working in a related occupation state that they can use the skills and knowledge from their initial training (as opposed to 85% on average across all occupations). When working in a completely different occupation, , 44% claim that they can still use what they have learned during their apprenticeship as opposed to 29% on average across all occupations.
(Source: Musekamp, 2010)

3 Conclusions

The aim of this paper is to provide further evidence of the feasibility of expanding dual system vocational education by examining its impact on the firms that provide apprenticeship and work placements. Firms' experience of providing workplace training within an apprenticeship or college-based training framework determines their participation which in turn underpins the viability of the systems in question.

A clear difference emerges from this study between the apprenticeship model of skill production and the full-time school-based route integrated into the wider education system. The apprenticeship route produces the range of skills that firms require in a relatively short time period. However, apprenticeship training such as Car Service with a strong technical knowledge base and electro-mechanical skills content requires the apprentice to be supervised by a fully-skilled technician while in the workplace. This requirement makes heavy demands on the resources of the smaller firms that dominate the sector. The investment of resources up-front has to be made while there is an uncertain outcome for the firm and the apprentice. If the supply of trained apprentices is insufficient and poaching is widespread, firms will be reluctant to invest. German firms, including the smaller firms, are far more likely to train an apprentice than UK firms and skill shortages are not a major concern compared to the UK.

Skill supply from the full-time college-based vocational route is more reliable and supply is more easily managed but fails to respond to demand. It is not well-adapted to industry's needs. The investment required from firms providing work placements is low and the work placement element can provide screening opportunities. However, periods of work experience linked to college courses as found in Spain fail to provide the intensive skill learning and consolidation provided by apprenticeship. As a result, firms taking on employees from full-time vocational training must bear much of the cost of providing the skills training needed by new employees over a much longer time period. In Spain, the result is that the workforce tends to be stratified into different skill levels with some employees never progressing to higher skill levels. This contrasts with the multi-skilled workforce developed as a result of the apprenticeship programme and found in Germany and the UK.

Culpepper (2003) identifies a combination of public labour market regulation and private employer coordination as the basis for maintaining the German apprenticeship training system. In our study, both labour market regulation and employer coordination emerge as key elements providing German employers with the confidence to invest in apprenticeship.

A fixed duration requirement for the apprenticeship, which allows the firm to benefit from the apprentice's productivity and offset costs, helps German firms to invest with more confidence. There is no fixed duration for the English apprenticeship and a longer apprenticeship duration could likewise help reduce the costs to firms.

However, a fixed duration for the award of an apprenticeship will only reduce uncertainty if, as in Germany, labour market regulation and cooperation between firms in a locality or region helps to enforce a hiring preference for a completed apprenticeship. Otherwise, apprentices may leave for another employer before completion. Labour market regulation in England, for example, requiring a completed Car Service apprenticeship for MOT certification status, combined with greater cooperative behaviour between firms could allow firms to invest in apprenticeship with more confidence.

If an apprenticeship model works well as in Germany, firms will recruit enough apprentices to maintain a sufficient skill supply, poaching is reduced and recruitment and induction costs are kept low. Since apprenticeship training develops a range of skills, flexible work organisation is facilitated. If firms judge the risk to their investment in apprenticeship to be too high as in the UK, the apprenticeship model works poorly and is undermined by a shortfall in firms supplying apprentice places. Ultimately, the UK government will need to start recognising the heavy demands that technical apprenticeships make on firms, in particular small firms. Apprenticeships which require a heavy investment in workplace training should be funded in a different way from those service sector apprenticeships where only light supervision is required in the workplace. Without such a change of direction many sectors reliant on skilled technicians will fail to flourish.

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Appendix: Case Study Methodology

Germany

Two case studies were carried out in Germany in August 2016 following the same questionnaire template as that used in the UK and Spanish case studies (see Appendix 1). Interviews were carried out in person on the interviewee's premises and lasted between one and two hours. The interviews were recorded and used to provide the information required by the questionnaire.

Both the German case study companies are independent and owner-managed. The larger firm (26 staff) is an authorized dealer for a well-known vehicle brand with 3 workshops carrying out service and repairs; the smaller firm (10 staff) is an authorized service centre for a different vehicle brand and services and repairs vehicles of all makes.

England

Six case studies were carried out in England between 22nd November 2016 and 15th April 2016. All but one of the case studies were conducted by a single interviewer with qualifications and expertise in the retail motor trade and training for car service. One case study also involved a second interviewer. Interviews were carried out in person on the interviewee's business premises, and lasted between one and two hours. Questions were based on a standardised questionnaire prepared by researchers at the BIBB and was also used for the parallel case studies carried out in Spain and in Germany. All interviews were recorded and transcribed and used to complete the questionnaire together with additional information supplied by the businesses themselves. Three industry associations were interviewed, focusing on issues raised in the questionnaire.

Size distribution of businesses visited for car service case studies: England

0-4	**5-9**	**10-19**	**20-49**	**50-99**	**100-249**	**>249**
-	3	-	1	-	2	-

Note: Where an interviewee supplied information on more than one establishment the average establishment size is used

Three of the firms interviewed were small independent companies carrying out service, MOT tests and repairs. One of these specialised in a single manufacturer brand, one worked on all manufacturers' brands and the third carried out general repairs. All had staff qualified to offer MOT testing, and one (the third) also sold MOT training packages.[10] The mid-range firm was a single manufacturer franchisee offering sales, after- sales warranty repairs, other repairs and servicing of the manufacturer's own brand. The remaining two large firms were mid-sized dealers having between 10 and 15 establishments operating from an urban hub. These were both independently-owned and dealt in sales, warranty work, servicing, MOT and repairs for vehicles manufactured by a range of leading companies.

[10] The MOT test (*Ministry of Transport*, or simply MOT) is an annual test of vehicle safety, roadworthiness aspects and exhaust emissions required in Great Britain for most vehicles over three

Spain

Six interviews were conducted in Spain using the same standard questionnaire as for the UK studies. Companies were selected with the assistance of Vocational Training establishments which train young people to acquire professional qualifications for the sector. (see Section 3 for the structure of vocational training in Spain). Because VET establishments form links with companies in order to place their students for work experience, this meant that most of the companies had some experience of student work placements/ work-based 'Dual training'. Mandatory work experience - *Formacion en Centros de Trabajo* (FTC)is part of the training curriculum. Students have to pass this practical part in order to get their final degree. In each firm one firm representative, an employee or the owner, has to be designated as responsible for work-place training. This person is also the one who decides whether the student has passed his or her practical training. A pass in FTC is a required element of the course.

The interviews were carried out by two interviewers, both Spanish speakers. In two cases the Spanish interviewers were accompanied by a researcher employed by the Federal Institute for Vocational Training (BIBB). The interviews took place in March and April 2016. The interviews were recorded but not transcribed and were written up in English using a format based on the questionnaire. Quotations from the interview were reported in Spanish and English. Interviews were also carried out with a representative of the German chamber of commerce in Spain as an expert for the development of dual training in Spain and a regional expert with responsibility for the establishment of training structures in Catalonia.
Of the six firms visited, half had between 20 and 70 employees while the remaining three had fewer than 10. Four of the six were independent businesses, the remaining two were owned by larger holding companies. The largest holding company had 1600 employees and 25 car dealerships with an average of 64 employees in each. In addition to being authorised dealers for several brands, specialisation was a feature of three of the companies, including -

- repair and testing injection pumps requiring specialist equipment and training
- servicing and repairs for taxi owners
- adapting cars for drivers with a disability

Size distribution of companies visited for Spanish case studies

0-4	**5-9**	**10-19**	**20-49**	**50-99**	**100-249**	**>249**
1	2	-	2	1	-	-

Note: Where an interviewee supplied information on more than one establishment the average establishment size is used.

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